AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An apparatus for the production of fatty acid alkyl ester comprising:

a first tank having a first outlet for providing naturally occurring fatty acids;

a second tank having a second outlet for providing an alkaline solution;

a third tank having a third outlet for providing an alcohol;

one inlet pipe coupled to said first, second and third outlets;

a reaction chamber having

an inlet in the bottom portion thereof coupled to said inlet pipe for receiving an emulsion comprising a combination of said fatty acids, said alkaline solution and said alcohol, for transesterification of said emulsion in the presence of ultrasonic energy,

an outlet in the top portion of said chamber, and

an ultrasonic device with an ultrasonic transmission horn inserted into the interior of said chamber for introducing ultrasonic energy into said reaction chamber;

a natural gravity separatory coupled to said outlet, said separatory having a discharge comprising fatty acid alkyl ester; and

a centrifuge for receiving said discharge and removing impurities therefrom.

2. (Original) The apparatus of Claim 1, wherein said naturally occurring fatty acids are animal fats.

3. (Original) The apparatus of Claim 1, wherein said naturally occurring fatty acids are vegetable oils.

4. (Previously Presented) The apparatus of Claim 1, wherein said alkaline solution is a concentrated form of one of the group comprising sodium hydroxide, potassium hydroxide, sodium methoxide, potassium methodoxide, and other strong mineral alkaline solutions.

5. (Original) The apparatus of Claim 1, wherein said alcohol is one of the group comprising methanol, ethanol, propanol, and other monoalkyl alcohols.

6. (Cancelled)

7. (Cancelled)

8. (Previously Presented) The apparatus of Claim 1, wherein said reaction chamber

comprises:

a cooling jacket containing a pump fed flow of a cooling liquid for maintaining said reactor chamber at a defined temperature; and

ultrasound generating means for propagating ultrasound radiation throughout said reaction chamber.

9. (Cancelled)

10. (Previously Presented) The apparatus of Claim 8, wherein said ultrasound generating means provides ultrasonic energy at frequencies of between generally about 20 kHz and generally about 50 KHz.

11. (Previously Presented) The apparatus of Claim 8, wherein said ultrasound generating means provides ultrasonic energy at power densities of between generally about 18 Ws/ml and generally about 65 Ws/ml.

12. (Original) The apparatus of Claim 8, wherein said reaction chamber is maintained at an operating temperature of between generally about 70°C and generally about 80°C and an operating pressure of between generally about 1.0 and generally

about 5.0 atmospheres.

13. (Previously Presented) The apparatus of Claim 8, wherein said natural gravity separation operates to separate said transesterified emulsion into a glycerol solution and fatty acid alkyl ester.

14. (Original) The apparatus of Claim 13, wherein said fatty acid alkyl ester is introduced into said centrifuge for washing and drying, wherein said washing and drying involves the removal of traces of the catalyst, residual alcohol, and any remaining glycerol, soaps, and excess water.

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Cancelled)

20. (Cancelled)

21. (Cancelled)

22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

25. (Cancelled)

26. (Cancelled)

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)

30. (Cancelled)

31. (Cancelled)

32. (Cancelled)

33. (Cancelled)

34. (Cancelled)

35. (Cancelled)

36. (Previously Presented) The apparatus of Claim 1, wherein said third tank is configured to provide said alcohol at an excess loading level of generally about 0% to about 2.4% of stoichiometric requirements per weight of said naturally occurring fatty acid.

37. (Previously Presented) The apparatus of Claim 36, wherein naturally occurring fatty acids are at least one of animal fats and vegetable fats.

38. (Previously Presented) The apparatus of Claim 37, wherein said alkaline solution is a concentrated form of one of the group comprising sodium hydroxide, potassium hydroxide, sodium methoxide, potassium methodoxide, and other strong mineral alkaline solutions.

39. (Previously Presented) The apparatus of Claim 38, wherein said alcohol is one of the group comprising methanol, ethanol, propanol, and other monoalkyl alcohols.

40. (Currently Amended) The apparatus of Claim 39, wherein said reaction chamber comprises:

a cooling jacket containing a pump fed flow of a cooling liquid for maintaining said reactor chamber at an operating temperature of between generally about 70°C and generally about 80°C; and

~~ultrasound generating means for propagating ultrasound radiation throughout said reaction chamber~~, and

wherein said ultrasound generating means provides ultrasonic energy at frequencies of

between generally about 20 kHz and generally about 50 KHz, power densities of between generally about 18 Ws/ml and generally about 65 Ws/ml, and said reaction chamber is maintained at an operating pressure of between generally about 1.0 and generally about 5.0 atmospheres.

41. (Currently Amended) A system for production of ASTM biodiesel fuel comprising:

supply tanks for supplying naturally occurring fatty acids, an alkaline solution and an alcohol directly to a common conduit;

an ultrasonic reaction chamber having an inlet in its bottom portion coupled to said common conduit for transesterification of an emulsion in the presence of ultrasonic energy under pressure of between about 1.0 atmosphere and about 5.0 atmospheres ~~and~~ , said reaction chamber being encased in a cooling jacket for maintaining ~~at~~ a temperature ~~of~~ between about 70°C to about 80°C, said emulsion comprising a mixture of said naturally occurring fatty acids, ~~an~~ said alkaline solution and ~~an~~ said alcohol, and an outlet in the top portion of said chamber; and

a separatory coupled to said outlet for receiving said transesterified emulsion from said chamber and separating said transesterified emulsion into a fatty acid alkyl ester and a glycerine solution; and

wherein said ultrasonic energy is at a frequency between about 20 kHz and about 50 KHz, and at a power density between about 18 Ws/ml and about 65 Ws/ml.

42. (Currently Amended) The system of Claim 41 ~~43~~, wherein said naturally occurring fatty acid is at least one of an animal fat and a vegetable fat.

43. (Currently Amended) The system of Claim 42 ~~43~~, wherein said alkaline solution is one of sodium hydroxide, potassium hydroxide, sodium methoxide, potassium methodoxide, and other strong mineral alkaline solutions.

(Previously Presented) The system of Claim 43, wherein said alcohol is one of methanol, ethanol, propanol, and other monoalkyl alcohols.